INTRODUCING EXPLICIT ASSESSMENT OF RESEARCH SKILLS IN A MASTERS PROGRAM

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Problem

The Master of Molecular Biology is a coursework masters with the capstone experience for students being a semester-long research project conducted in a research laboratory. The attainment of, and competency, in many of the skills required to achieve in the research project was assumed to be a consequence of the completion of the foundation courses. This was identified as problematic – it was unknown if students gained these skills; students were unable to evidence their skill set to prospective supervisors, and students without these skills would lead to reputational loss for the program impacting subsequent cohorts.

Plan

To address the problem, it was proposed to introduce skills assessment into one of the compulsory core courses, BIOC7001. These assessments were to be: explicit as it has been shown that students have poor awareness of having received instruction in a particular skill (Scott, 2005) and are poor in gauging their own learning (Matthews, Hodgson & Varsavsky, 2013). Previous work has established the key skills that students and staff deem important (Constantin & Ridge, 2014; Leggett, Kinnear, Boyce & Bennett, 2004). Of these, four research skills were selected: 1. "chemical numeracy"; 2. use of common laboratory equipment; 3. the interpretation of published protocols and; 4. interpretation of published data.

Action

Four new assessment items were designed and introduced into the 2014 iteration of BIOC7001. Each item: was a pass/fail assessment where failure to pass any one piece restricted the grade that could be obtained by the student; was open for a three-week period and; allowed a student five attempts to pass the assessment, with personalized feedback provided between attempts. The assessment pieces introduced were:

1. An online quiz testing chemical numeracy.
2. An in-laboratory pipette usage competency test.
3. An in-laboratory exercise in the interpretation of a published protocol.
4. An online task asking students to interpret and explain published graphical data.

Reflection

Implementing these new pieces of assessment required a significant amount of effort. For the online assessment pieces, pools of questions were developed that were large enough to ensure that students were not presented with the same question, or set of questions, more than once as they progressed through their attempts. The online quiz could be marked automatically but the fourth assessment piece required timely written feedback for each student attempt – this required a considerable effort on the part of the course coordinator. For the in-laboratory assessments, time had to be made available within the existing laboratory sessions to accommodate the competency tests, and tutors were required to observe and evaluate the students. Data will be presented showing the progression of students in these pieces such as: how many attempts are required to pass; evidence of improvement following attempt-feedback cycles. A number of technical and implementation problems have already been identified and suggestions of how to resolve there will be presented. Overall, these assessment items have greatly improved my confidence in the competency of the students that complete my course and, students now have a means to evidence their competencies.

References

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